

CLAIMS

1. A manufacturing method for an electronic device providing an IC chip having an external electrode formed respectively on each of the faces of an opposing pair of faces, a transmission and reception antenna having a slit formed therein and a bridging plate that electrically connects the IC chip and the antenna, wherein

when at least one of the plurality of IC chips that are arranged is positionally aligned corresponding to the determined position on the antenna circuit to be mounted, then the remaining IC chips can be disposed at once and together in the prescribed positions on the antenna circuit without the necessity of performing high precision positioning.

2. A manufacturing method for an electronic device providing an IC chip having an external electrode formed respectively on each of the faces of an opposing pair, a transmission and reception antenna having a slit formed therein and a bridging plate that electrically connects the IC chip and the antenna, having at least the steps of:

forming a plurality of antenna circuits using a first metallic film and forming an antenna substrate by disposing the antenna circuits on a base substrate, or forming an antenna substrate by providing a plurality of antenna circuits from the first metallic film disposed on a base substrate;

arranging in at least one of a longitudinal orientation or a horizontal orientation, a plurality of the IC chips, with the same intervals therebetween as are required when the plurality of the IC chips are arranged in determined positions with respect to the corresponding circuits of the plurality of antenna circuits that the plurality of the IC

chips is mounted thereon;

tentatively securing the plurality of IC chips at once, to bridging plates having a second metallic film formed thereon via a first anisotropic conductive adhesive layer such that the plurality of the IC chips thus arranged are electrically connected, and

5 producing bridging plates with the IC chips attached;

positionally aligning the bridging plates with IC chips attached in the determined position on the plurality of antenna circuits such that the plurality of the IC chips are electrically connected; and

performing thermal compression binding that joins the bridging plates with IC
10 chips attached at once in the determined positions on the antenna substrate via a second anisotropic conductive adhesive layer.

3. A manufacturing method for an electronic device providing an IC chip having an external electrode formed respectively on each of the faces of an opposing
15 pair, a transmission and reception antenna having a slit formed therein and a bridging plate that electrically connects the IC chip and the antenna, having at least the steps of:

forming a plurality of antenna circuits using a first metallic film and forming an antenna substrate by disposing the antenna circuits on a base substrate, or forming an antenna substrate by providing a plurality of antenna circuits from the first metallic film
20 disposed on a base substrate;

arranging in at least one of a longitudinal orientation or a horizontal orientation, a plurality of the IC chips, with the same intervals therebetween as are required when the plurality of the IC chips are arranged in determined positions with respect to the corresponding circuits of the plurality of antenna circuits that the plurality of the IC

chips is mounted thereon;

tentatively securing the IC chips, via the first anisotropic conductive adhesive layer, after the plurality of the arranged IC chips have been positionally aligned at once, such that the plurality of the IC chips is electrically connected in the determined positions with respect to the corresponding circuits of the plurality of antenna circuits that the plurality of the IC chips is mounted thereon;

positionally aligning the tentatively secured plurality of IC chips with bridging plates having a second metallic film so as to be electrically connected in the determined position on an antenna circuit; and

performing thermal compression binding that joins the bridging plates at once on the plurality of the IC chips and the antenna substrate, via a second anisotropic conductive adhesive layer.

4. A manufacturing method for an electronic device providing an IC chip having an external electrode formed respectively on each of the faces of an opposing pair, a transmission and reception antenna having a slit formed therein and a bridging plate that electrically connects the IC chip and the antenna, having at least the steps of:

forming a plurality of antenna circuits using a first metallic film and forming an antenna substrate by disposing the antenna circuits on a base substrate, or forming an antenna substrate by providing a plurality of antenna circuits from the first metallic film disposed on a base substrate;

forming a first anisotropic conductive adhesive layer in the determined position on the antenna circuit;

arranging in at least one of a longitudinal orientation or a horizontal orientation,

a plurality of the IC chips, with the same intervals therebetween as are required when the plurality of the IC chips are arranged in determined positions with respect to the corresponding circuits of the plurality of antenna circuits the plurality of the IC chips is mounted thereon;

5 tentatively securing the IC chips, after the plurality of the IC chips arranged on the first anisotropic conductive adhesive layer have been positionally aligned at once, such that the plurality of the IC chips is electrically connected in the determined positions with respect to the corresponding circuits of the plurality of antenna circuits that the plurality of IC chips is mounted thereon;

10 forming a second anisotropic conductive adhesive layer in the determined position on the plurality of IC chips thus secured and the antenna circuits;

 positionally aligning the tentatively secured plurality of IC chips with bridging plates having a second metallic film so as to be electrically connected in the determined position on an antenna circuit; and

15 performing thermal compression binding that joins the bridging plates at once on the plurality of the IC chips and the antenna substrate.

5. A manufacturing method for an electronic device providing an IC chip having an external electrode formed respectively on each of the faces of an opposing
20 pair, a transmission and reception antenna having a slit formed therein and a bridging plate that electrically connects the IC chip and the antenna, having at least the steps of:

 dividing a bridging plate such that one piece is equivalent to the number of the IC chips in a line arranged in the widthwise direction of an antenna substrate, that can be subject to thermal compression binding at once, line by line;

positionally aligning the bridging plates with one row of antenna circuits arranged in the widthwise direction of an antenna substrate; and

performing thermal compression binding that joins the bridging plates on the IC chips and the antenna substrate via an anisotropic conductive adhesive layer.

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6. The manufacturing method for an electronic device according to any of claim 1 to 5 wherein at least one of the first or the second metallic film is aluminum.

7. The manufacturing method for an electronic device according to any of claim 1 to claim 6 wherein at least one of the first or the second metallic film is supported on a base substrate of an organic resin, this organic resin being selected from among polyvinyl chloride (PVC), acrylonitrile butadiene styrene (ABS), polyethylene terephthalate (PET), polyethylene terephthalate glycol derivative (PETG), polyethylene naphthalate (PEN), polycarbonate resin (PC), biaxial polyester (O-PET), or polyimide resin.

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8. The manufacturing method for an electronic device according to any of claim 1 to claim 6 wherein at least one of the first or the second metallic film is supported on a base substrate comprised of paper.

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9. The manufacturing method for an electronic device according to any of claim 1 to claim 8 wherein the gaps between the antenna substrate and bridging plate are sealed by thermal compression binding of the first and second anisotropic conductive adhesive layers.

10. The manufacturing method for an electronic device according to any of claim 1 to claim 9 wherein after the process in that the plurality of IC chips are thermal compression bound at once with the antenna substrate and the bridging plates, a process is performed in that a continuum of antenna circuits is cut into individual pieces.

11. A member of an electronic device that electronic device provides an IC chip having an external electrode formed respectively on each of the faces of an opposing pair, a transmission and reception antenna having a slit formed therein and a bridging plate that electrically connects the IC chip and the antenna, wherein the member is semiconductor elements of the condition in that an anisotropic conductive adhesive layer having been formed on the respective surfaces of the IC chip that the external electrodes attach thereto, the IC chip is enclosed between these anisotropic conductive adhesive layers.

12. A member of an electronic device that electronic device provides an IC chip having an external electrode formed respectively on each of the faces of an opposing pair, a transmission and reception antenna having a slit formed therein and a bridging plate that electrically connects the IC chip and the antenna, wherein the member is semiconductor elements of the condition in that an anisotropic conductive adhesive layer having been formed on the respective surfaces of the IC chip that the external electrodes attach thereto, the IC chip is enclosed between these anisotropic conductive adhesive layers while another bridging plate has been disposed on the

surface of one of those anisotropic conductive adhesive layers.

13. The manufacturing method for an electronic device according to any of claim 1 to claim 10, wherein the method of arranging in at least one of a longitudinal orientation or a horizontal orientation, a plurality of the IC chips, with the same intervals therebetween as are required when the plurality of the IC chips are arranged in determined positions with respect to the corresponding circuits of the plurality of antenna circuits that the plurality of the IC chips is mounted thereon and arranging the plurality of IC chips at once, is a method that involves using a jig providing from a few to several thousands of concavities of the appropriate dimensions to accommodate an IC chip, then shaking the jig such that the IC chips on the jig are accommodated in each of the concavities.

14. The manufacturing method for an electronic device according to any of claim 1 to claim 10 wherein thermal compression binding is performed that joins the bridging plates and the IC chips with the antenna substrate.